

rejection, and an answer to the substance of Applicant's previous arguments are earnestly requested. Should the Section 102(b) rejection be maintained, Applicant requests documentation in support thereof.

Applicant submits that *Renteln* does not identically disclose or describe determining that the wafer is being polished in a center-offset manner. *Renteln* does not mention the term "center-offset." The methods suggested in *Renteln* assume that the semiconductor wafer is rotated about its own axis while pressed against a rotating polishing pad (*see* col. 3, lines 41-46). Based on this assumption, *Renteln* only measures the wafer along a single radius and extrapolates the measurements to the entire wafer (*see* col. 4, lines 8-13 and 35-43). However, for the likely condition where the center of wafer rotation is even slightly offset from the center of the wafer itself, *Renteln's* assumption fails, and the rate of removal computations include error. In that case, a true center-offset condition cannot be determined using the teachings of *Renteln*. *Renteln* doesn't teach determining whether a wafer is being polished in a center-offset manner, but rather to make rote measurements and observe patterns thereto between wafers. In contrast, the present invention includes the limitation to determine that a particular wafer is being polished in a center-offset manner, *e.g.*, by measuring the thickness across the wafer (page 7, lines 11-13).

In addition, while *Renteln* recognizes that the actual rate of removal depends upon pre-polishing (wafer) surface topography (*see* col. 1, lines 52-56). However, *Renteln* doesn't teach accounting for topography-induced rate of removal computation errors introduced through a pre-polishing measurement (*see* col. 6, lines 46-51). The feedback algorithm suggested in *Renteln* is directed at detecting a pattern over a number of wafers (*see* col. 6, lines 36-42, non-uniformity for three successive wafers necessary before a correction is made; *see also* FIG. 8, recipe correction made after 12 wafers). Applicants suggest that *Renteln* does not determine whether a (particular) wafer is being polished in a center-offset manner as does the present invention. Instead, *Renteln* only discloses determining rate of removal trends based on approximate measurements of multiple wafers.

Furthermore, the teachings of *Renteln* are directed at conditioning a polishing pad in response to wafer measurements intended to determine rate of removal. *Renteln* does not teach, as a response to a determination that a wafer is being polished in a center-offset manner, and in addition to conditioning the pad, to position the wafer (or a wafer carrier) misaligned with

respect to the polishing pad. *Renteln* doesn't contemplate misalignment of the wafer (carrier). Wafer (carrier) alignment is not included as a variable affecting rate of removal (*see* col. 1, lines 50-56 listing pressure and wafer surface topography as factors affecting rate of removal).

Each pending claim of the present invention includes a misalignment limitation responsive to determination of a wafer being polished in a center-offset manner. Independent claim 1 includes positioning the wafer carrier misaligned, with respect to the pad, as a function of the wafer being polished in the center-offset position. Independent claim 11 includes positioning the wafer misaligned, with respect to the polishing means, responsive to the means for determining whether the wafer is polishing in a center-offset manner. Independent claim 12 includes the wafer carrier being misaligned, relative to the polishing pad, as a function of the wafer having been polished in a center-offset manner. Independent claim 17 includes compensating for the wafer being polished in a center-offset manner by positioning the wafer carrier misaligned with respect to the pad. Dependent claims, depending from the above-mentioned independent claims, also each include a limitation of misaligned positioning from its respective independent claim.

It is not clear that the respective method and arrangement set forth in the claims of the present invention can be properly aligned to the asserted prior art. In considering Applicant's arguments filed on January 22, 2001, the Examiner cited *Renteln* figure 3 and col. 4, lines 44-55 as disclosing the "positioning the wafer carrier misaligned with respect to the pad as a function of the wafer being polished in the center offset manner" aspect of the invention. The *Renteln* paragraph comprising col. 4, lines 44-55 discusses positioning of a conditioning wheel (not a wafer or wafer carrier), to condition the polishing pad, at a specific radius based upon (wafer) measurements. The *Renteln* paragraph continues on to point out how the specific radius of the polishing pad (that needs to be conditioned) is determinable from wafer measurements (due to the circular rotation of the wafer, the polishing pad can affect a range of all radii of the wafer having a value greater than wafer radius which is coincident with the specific pad radius). The fact that a specific polishing pad radius to condition is determinable from wafer measurements is true because the wafer (carrier) rotates, and is true independent of, and without regard to, the alignment of the wafer (carrier).

Renteln col. 4, lines 44-55 do not disclose or suggest misaligning the wafer (carrier) as a response to a determination of a center-offset position. *Renteln* figure 3 does not show a wafer

(carrier) misaligned with respect to the polishing pad. In fact, *Renteln* figure 3 clearly shows the wafer centered (aligned) within the designated wafer track. Figure 3 certainly does not indicate any wafer (carrier) misalignment as a response to a determination that the wafer is being polished in a center-offset manner. Therefore, Applicants respectfully disagree that the cited portions of *Renteln*, and indeed any other portions of *Renteln*, identically disclose misaligning the wafer (carrier) in response to determining the wafer is being polished in a center-offset manner.

In regard to the Section 102(b) rejection of claims 1-12 and 14-19 over the *Renteln* reference, the Final Office Action has provided no support for the rejection of independent claims 1, 11, 12 and 17, and has not provided rationale for the assertion that the independent claims are not a patentable advance, as required by 35 U.S.C§132. In specific regard to the independent claims, the Office Action has not pointed out, nor can the Applicant discover, any portion of the cited reference that teaches determining the wafer is being polished in a center-offset manner, or that teaches positioning the wafer carrier misaligned with respect to the polishing pad. Pursuant to MPEP §1208.01, any new evidence supporting the §102(b) rejection raised on appeal will be considered new grounds of rejection and require reopening prosecution.

In light of the lack of support for the §102(b) rejection in the portions of *Renteln* cited in the Final Office Action, and in view of the remarks above, Applicants believe independent claims 1, 11, 12 and 17 are in condition for allowance. Further, since the remaining claims (2-10, 14-16 and 18-19) depend from claims having allowable subject matter, such claims should also be allowable as indicated at MPEP §2143.03 (regarding allowability of a dependent claim relative to an allowable independent base claim). Reconsideration and withdrawal of the final rejection, along with a favorable response, are earnestly requested.

Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is encouraged to contact the undersigned at 651/686-6633.

CRAWFORD PLLC
1270 Northland Drive, Suite 390
St. Paul, Minnesota 55120
(651) 686-6633

By: 

Name: Robert J. Crawford

Reg. No.: 32,122